AMENDMENTS TO THE CLAIMS

Please amend Claims 1, 7, 11-13, 15-20, 25, 28-30, and 32-38 as follows.

Please add Claims 59 and 60 as follows.

Please cancel Claims 3, 8, and 21 without prejudice.

1.   (Currently Amended) A method of adaptive encoding at least a part of a current frame of a sequence of frames of framed data, the method comprising:

dividing the part of the current frame into blocks;

performing a first sub-encoding on a first block or set of blocks;

performing a second sub-encoding on the first sub-encoded block, the second sub-encoding adapting at least one encoding parameter based upon characteristic indicative of an energy content of the first sub-encoded part of the current frame, the characteristic being determined by prediction, without using the first sub-encoded block and without using the set of blocks of the current frame, and at least in part from of the frames of the sequence only those frames that are a reference frame, wherein computing of the characteristic is based upon the time elapsed between the current frame and the reference frame or frames; and

performing the first sub-encoding and the second sub-encoding on another block or set of blocks of the part of the current frame.

2.   (Original) The method of Claim 1, wherein performing the first sub-encoding and performing the second sub-encoding are performed on another block or set of blocks of the part of the current frame in the foregoing listed order.

3.   (Cancelled)

4.   (Previously Presented) The method of Claim 1, wherein the encoded frames are transmitted over a transmission channel and wherein the adaptive encoding method compensates for channel bandwidth limitations and adapts the second sub-encoding parameters based at least in part upon the characteristic.

5. (Original) The method of Claim 1, wherein the adaptive encoding of at least a part of the current frame is performed with respect to a reference frame, the first sub-encoding comprising:

performing transformation parameter estimation of a block with respect to the reference frame; thereafter

performing transformation compensation on the block; and thereafter

determining the error block.

6. (Original) The method of Claim 1, wherein the second sub-encoding is selected from the group comprising: wavelet encoding, quadtree or binary tree coding, DCT coding and matching pursuits coding.

7. (Currently Amended) A method of adaptive encoding at least a part of a current frame of a sequence of frames of framed data, with respect to a reference frame comprised in the sequence, the method comprising:

dividing the reference frame into blocks and identifying selected blocks of the reference frame in accordance with the performance of a first sub-encoding that is applied to the reference frame;

computing a characteristic indicative of an energy content, the characteristic being determined by prediction without using a result of the first sub-encoding of the current frame, without using blocks of the current frame, and based on the identifying of the blocks and from the frames of the sequence only those frames that are a reference frame, wherein computing of the characteristic is based upon the time elapsed between the current frame and the reference frame or frames;

performing the first sub-encoding on the current frame; and

performing a second sub-encoding on the first sub-encoded frame, the second sub-encoding adapting at least one encoding parameter based at least in part upon the computed characteristic.

8. (Cancelled)

9. (Previously Presented) The method of Claim 7, wherein the identifying selected blocks depends upon motion vectors determined for the blocks.

10. (Previously Presented) The method of Claim 9, wherein the blocks of the reference frame have a first identity when the blocks are intra-coded or when the blocks have a substantial zero motion vector, the blocks of the reference frame have a second identity otherwise, the computed characteristic being the sum of:

the sum of all measures of prediction errors of blocks with the first identity; and

a normalized sum of all measures of prediction errors of blocks with the second identity multiplied with the time elapsed between the current frame and the reference frame.

11. (Currently Amended) An apparatus for adaptive encoding of a part of a current frame of a sequence of frame of framed data, the apparatus comprising:

an encoder capable of performing first and second sub-encoding on a block or a set of blocks of the current frame and for adapting encoding parameters of the second sub-encoding based at least in part upon a characteristic indicative of an energy content related to the block or set of blocks of the current frame after it has been first sub-encoded; and

a decision circuit capable of determining the characteristic by prediction only from a reference frame or reference frames, and wherein the characteristic is determined by prediction without using the first sub-encoded block of the current frame and without using the set of blocks of the current frame, wherein computing of the characteristic is based upon the time elapsed between the current frame and the reference frame or frames.

12. (Currently Amended) An apparatus for adaptive encoding at least a part of a current frame of a sequence of frames of framed data, with respect to a reference frame comprised in the sequence, comprising:

an encoder for first sub-encoding the reference frame;

means for dividing the reference frame into blocks and identifying selected blocks of the reference frame in accordance with the output of the encoding circuit;

means for computing a characteristic indicative of an energy content based on the identifying of the blocks and only on the reference frame or reference frames, and wherein the characteristic is determined by prediction without using a result of first sub-

encoding the current frame and without using blocks of the current frame, wherein computing of the characteristic is based upon the time elapsed between the current frame and the reference frame or frames;

an encoder for performing the first sub-encoding on the current frame;

an encoder for performing a second sub-encoding on the first sub-encoded frame; and

means for adapting the encoding parameters of the encoding circuit for the second sub-encoding at least based on the characteristic.

13. (Currently Amended) A method of implementing a two step encoding method, the two step encoding method comprising a first sub-encoding and a second sub-encoding, the method being applied to a current frame of a sequence of frames of framed data, the method comprising:

performing a decision step, the decision step being based on an estimate of a characteristic indicative of an energy content of the current frame that would be obtained when applying the first sub-encoding step to the current frame, the estimated characteristic being determined by prediction without using a result first sub-encoding the current frame, without using blocks of the current frame, and from at least in part from of the frames of the sequence only those frames that are a reference frame or reference frames, wherein computing of the characteristic is based upon the time elapsed between the current frame and the reference frame or frames, the decision step deciding whether the two step encoding method is to be applied to the current frame or not.

14. (Original) The method of Claim 13, wherein the encoded frames are transmitted over a channel and the method identifies channel bandwidth limitations.

15. (Currently Amended) A method of adaptive encoding at least a part of a current frame of a sequence of frames of framed data, with respect to a reference frame comprised in the sequence, the method comprising:

dividing the reference frame into blocks and identifying selected blocks of the reference frame in accordance with the performance of a first sub-encoding that is applied to the reference frame;

computing a characteristic indicative of an energy content based upon the identifying of the blocks and only on the reference frame or reference frames, the characteristic being determined by prediction without using a result of first sub-encoding the current frame and without using blocks of the current frame, wherein computing of the characteristic is based upon the time elapsed between the current frame and the reference frame or frames;

deciding based on the computed characteristic to perform or skip encoding the current frame; and

if encoding is performed, performing the first sub-encoding on the current frame and a second sub-encoding on the first sub-encoded frame.

16. (Currently Amended) A method of adaptive encoding at least a part of a current frame of a sequence of frames of framed data with respect to a reference frame comprised in the sequence, the method comprising:

dividing the reference frame into blocks and identifying selected blocks of the reference frame in accordance with the results of a first sub-encoding that is applied to the reference frame;

computing a characteristic indicative of an energy content that is based at least in part upon the identifying of the blocks and at least in part from only a reference frame or reference frames, the characteristic being determined by prediction without using a result of first sub-encoding the current frame and without using blocks of the current frame, wherein computing of the characteristic is based upon the time elapsed between the current frame and the reference frame or frames.;

dividing the current frame into blocks;

performing the first sub-encoding on a block of the current frame; and

performing a second sub-encoding on the first sub-encoded block of the current frame, and adapting, in the second sub-encoding, wherein the encoding parameters are based at least in part upon the computed characteristic.

17. (Currently Amended) An apparatus for implementing a two step encoding of a current frame of a sequence of frames of framed data, the two step encoding comprising a first sub-encoding and a second sub-encoding step, comprising:

means for calculating an estimate of a characteristic indicative of an energy content of the current frame by prediction from only a reference frame or reference frames of the characteristic that would be obtained when applying the first sub-encoding to the current frame, and wherein the characteristic is determined by prediction without using a result of sub-encoding the current frame and without using blocks of the current frame and wherein computing of the characteristic is based upon the time elapsed between the current frame and the reference frame or frames,; and

a decision circuit for deciding, based at least in part upon the estimated characteristic, whether the two step encoding will be applied to the current frame or not.

18. (Currently Amended) An apparatus for adaptive encoding of at least a part of a current frame of a sequence of frames of framed data with respect to a reference frame comprised in the sequence, the apparatus comprising:

an encoder for applying a first sub-encoding to the reference frame;

means for dividing the reference frame into blocks and for identifying selected blocks of the reference frame in accordance with the output of the encoding circuit;

means for computing a characteristic indicative of an energy content based upon the identifying of the blocks and by prediction without using a result of first sub-encoding the current frame, without using blocks of the current frame, and from only those frames that are a reference frame wherein computing of the characteristic is based upon the time elapsed between the current frame and the reference frame or frames;

means for deciding based on the characteristic to perform or skip encoding of the current frame;

an encoder for performing the first sub-encoding on the current frame; and

an encoder for performing a second sub-encoding on the first sub-encoded frame in response to the decision circuit determining that the encoding is performed.

19.   (Currently Amended) An apparatus for adaptive encoding of at least a part of a current frame of a sequence of frames of framed data with respect to a reference frame comprised in the sequence, the apparatus comprising:

an encoder for applying a first sub-encoding to the reference frame;

means for dividing the reference frame into blocks and identifying selected blocks of the reference frame in accordance with the output of the encoding circuit;

means for computing a characteristic indicative of an energy content, wherein the characteristic is determined by prediction without using a result of first sub-encoding the current frame, without using blocks of the current frame, and is based on only on the reference frame or reference frames, wherein computing of the characteristic is based upon the time elapsed between the current frame and the reference frame or frames;

means for dividing the current frame into blocks;

an encoder for performing a second sub-encoding on the first sub-encoded block of the current frame;

an encoder for performing the first sub-encoding on a block of the current frame; and

means for adapting the encoding parameters of the second sub-encoding circuit based on at least the characteristic.

20.   (Currently Amended) A method of adaptive encoding at least a part of a current frame of a sequence of frames of framed data, the method comprising:

dividing at least part of the current frame into blocks;

performing a first sub-encoding on one of the blocks;

performing a second sub-encoding on the first sub-encoded block, wherein the second sub-encoding adapts at least one encoding parameter based upon a predicted characteristic indicative of an energy content that is determined at least in part by evaluating a characteristic of only those frames that are a reference frame, the characteristic being determined by prediction without using the first sub-encoded block and without using blocks of the current frame, wherein computing of the characteristic is

based upon the time elapsed between the current frame and the reference frame or frames; and

performing the first sub-encoding and the second sub-encoding on another block of the part of the current frame.

21. (Cancelled)

22. (Previously Presented) The method of Claim 20, wherein the encoded frames are targeted for transmission over a transmission channel and wherein the method accounts for channel bandwidth limitations by adapting the second sub-encoding parameters based on the characteristic.

23. (Original) The method of Claim 20, wherein the adaptive encoding of at least a part of the current frame is performed with respect to a reference frame, the first sub-encoding comprising:

performing transformation parameter estimation of a block with respect to the reference frame;

performing transformation compensation on the block; and

determining an error block.

24. (Original) The method of Claim 20, wherein the second sub-encoding is selected from the group comprising wavelet: encoding, quadtree or binary tree coding, DCT coding and matching pursuits coding.

25. (Currently Amended) A method of adaptive encoding at least a part of a current frame of a sequence of frames of framed data, with respect to a reference frame comprised in the sequence, the method comprising:

dividing the reference frame into blocks;

identifying selected blocks of the reference frame in accordance with the performance of a first sub-encoding that is applied to the reference frame;

performing the first sub-encoding on the current frame;

computing a characteristic indicative of an energy content based on the identifying of the blocks and from the frames of the sequence only those frames that are a reference frame, wherein the characteristic is determined by prediction without using the first sub-

encoded frame and without using blocks of the current frame, and wherein computing of the characteristic is based upon the time elapsed between the current frame and the reference frame or frames;

performing the first sub-encoding on the current frame; and

performing a second sub-encoding on the first sub-encoded frame, wherein the second sub-encoding adapts at least one encoding parameter based on the computed characteristic.

26. (Previously Presented) The method of Claim 25 wherein the computing of the characteristic is derived at least in part by calculating the time elapsed between the current frame and the reference frame.

27. (Previously Presented) The method of Claim 25, wherein the blocks of the reference frame have a first identity when the blocks are intra-coded or when the blocks have a substantial zero motion vector, the blocks of the reference frame have a second identity otherwise, the computed characteristic being the sum of:

the sum of all measures of prediction errors of blocks that have the a first identity; and

a normalized sum of all measures of prediction errors of blocks that have the second identity multiplied by the time elapsed between the current frame and the reference frame.

28. (Currently Amended) An apparatus for adaptive encoding of a part of a current frame of a sequence of frames of framed data, the apparatus comprising:

an encoder capable of performing a first sub-encoding and a second sub-encoding on a block of the current frame and for adapting encoding parameters of the second sub-encoding based at least in part upon a characteristic indicative of an energy content that is related to the block of the current frame after the block has been first sub-encoded, and wherein the characteristic is determined by prediction without using the first sub-encoded block and without using blocks of the current frame and wherein computing of the characteristic is based upon the time elapsed between the current frame and a reference frame or frames,; and

a decision circuit capable of predicting only from a the reference frame or references frames the characteristic of the current frame after at least one of the blocks of the current frame have been first sub-encoded.

29. (Currently Amended) An apparatus for adaptive encoding at least a part of a current frame of a sequence of frames of framed data, with respect to a reference frame comprised in the sequence, the apparatus comprising:

an encoder for first sub-encoding the reference frame;

means for dividing the reference frame into blocks and identifying selected blocks of the reference frame in accordance with the output of the encoding circuit;

means for computing a characteristic indicative of an energy content based on the identifying of the blocks and only on the reference frame or reference frames, and wherein the characteristic is determined by prediction without using a result of first sub-encoding the current frame and without using blocks of the current frame, and wherein computing of the characteristic is based upon the time elapsed between the current frame and the reference frame or frames;

an encoder for performing the first sub-encoding step on the current frame; and

an encoder for performing a second sub-encoding on the first sub-encoded frame and means for adapting the encoding parameters of the encoding circuit for the second sub-encoding based on the characteristic.

30. (Currently Amended) A method of implementing a two-step encoding method, the two-step encoding method comprising a first sub-encoding and a second sub-encoding, the two-step encoding method being applied to a current frame of a sequence of frames of framed data, the method comprising:

determining whether to perform a two-step encoding method, wherein the determining is based at least in part upon a characteristic indicative of an energy content of the current frame that would be obtained when applying the first sub-encoding step to the current frame, wherein the characteristic is determined by prediction from only a reference frame or reference frames, and wherein the characteristic is determined by prediction without using a result of first sub-encoding the current frame and without

using blocks of the current frame, and wherein computing of the characteristic is based upon the time elapsed between the current frame and the reference frame or frames.

31. (Original) The method of Claim 30, wherein the encoded frames are targeted for transmission over a channel and wherein the method accounts for channel bandwidth limitations.

32. (Currently Amended) A method of adaptive encoding at least a part of a current frame of a sequence of frames of framed data, with respect to a reference frame comprised in the sequence, the method comprising:

dividing the reference frame into blocks and identifying selected blocks of the reference frame in accordance with the performance of a first sub-encoding that is applied to the reference frame;

computing a characteristic indicative of an energy content that is based at least in part upon the identifying of the blocks and only on the reference frame or reference frames, and wherein the characteristic is determined by prediction without using a result of first sub-encoding the current frame and without using blocks of the current frame, and wherein computing of the characteristic is based upon the time elapsed between the current frame and the reference frame or frames;

deciding, based on the computed characteristic, whether perform or skip encoding the current frame;

if encoding is performed, performing the first sub-encoding on the current frame and a second sub-encoding on the first sub-encoded frame.

33. (Currently Amended) A method of adaptive encoding at least a part of a current frame of a sequence of frames of framed data with respect to a reference frame comprised in the sequence, the method comprising:

dividing the reference frame into blocks;

identifying selected blocks of the reference frame in accordance with the performance of a first sub-encoding applied to the reference frame;

dividing the current frame into blocks;

performing the first sub-encoding on a block of the current frame;

computing a characteristic indicative of an energy content that is based at least in part upon the identifying of the blocks and only on the reference frame or reference frames, wherein the characteristic is determined by prediction without using the first sub-encoded frame and without using blocks of the current frame, and wherein computing of the characteristic is based upon the time elapsed between the current frame and the reference frame or frames;

dividing the current frame into blocks;

performing the first sub-encoding on a block of the current frame; and

performing a second sub-encoding on the first sub-encoded block of the current frame, and adapting, in the second sub-encoding, the encoding parameters thereof based on the computed characteristic.

34.   (Currently Amended) An apparatus for implementing a two-step encoding of a current frame of a sequence of frames of framed data, the two-step encoding comprising a first sub-encoding and a second sub-encoding step, comprising:

means for calculating a characteristic indicative of an energy content of the current frame by prediction from only a reference frame or reference frames of the characteristic that would be obtained when applying the first sub-encoding to the current frame, and wherein the characteristic is determined by prediction without using a result of first sub-encoding the current frame and without using blocks of the current frame, and wherein computing of the characteristic is based upon the time elapsed between the current frame and the reference frame or frames,; and

a decision circuit for deciding, based on the characteristic whether the two-step encoding will be applied to the current frame or not.

35.   (Currently Amended) An apparatus for adaptive encoding of at least a part of a current frame of a sequence of frames of framed data with respect to a reference frame comprised in the sequence, comprising:

an encoder for applying a first sub-encoding step to the reference frame;

means for dividing the reference frame into blocks and for identifying selected blocks of the reference frame in accordance with the output of the encoding circuit;

means for computing a characteristic indicative of an energy content based on the identifying of the blocks and only on the reference frame or reference frames, ~~and~~ wherein the characteristic is determined by prediction without using a result of first sub-encoding the reference frame and without using blocks of the current frame, and wherein computing of the characteristic is based upon the time elapsed between the current frame and the reference frame or frames,;

means for deciding based on the characteristic to perform or skip encoding of the current frame;

an encoder for performing the first sub-encoding on the current frame; and

an encoder for performing a second sub-encoding on the first sub-encoded frame in response to the decision circuit determining that the encoding is performed.

36. (Currently Amended) An apparatus for adaptive encoding of at least a part of a current frame of a sequence of frames of framed data with respect to a reference frame comprised in the sequence, comprising:

an encoder for applying a first sub-encoding to the reference frame;

means for dividing the reference frame into blocks and identifying selected blocks of the reference frame in accordance with the output of the encoding circuit;

means for computing a characteristic indicative of an energy content based on the identifying of the blocks and only on the reference frame or reference frames, ~~and~~ wherein the characteristic is determined by prediction without using a result of first sub-encoding the current frame and without using blocks of the current frame, and wherein computing of the characteristic is based upon the time elapsed between the current frame and the reference frame or frames,;

means for dividing the current frame into blocks;

an encoder for performing the first sub-encoding on a block of the current frame;

an encoder for performing a second sub-encoding on the first sub-encoded block of the current frame; and

means for adapting the encoding parameters of the second sub-encoding circuit based on the characteristic.

37. (Currently Amended) A method of adaptive encoding at least a part of a current frame of a sequence of frames of framed data, with respect to a reference frame comprised in the sequence, the method comprising:

dividing the reference frame into blocks and identifying selected blocks of the reference frame in accordance with the performance of a first sub-encoding that is applied to the reference frame;

computing a characteristic based on the identifying of the blocks and from the frames of the sequence only those frames that are a reference frame, wherein the identifying of the blocks depends upon motion vectors determined for the blocks, and wherein the blocks of the reference frame have a first identity when the blocks are intra-coded or when the blocks have a substantial zero motion vector, the blocks of the reference frame have a second identity otherwise, the computed characteristic being ~~the sum~~based on ~~of~~:

~~the sum of all~~ measures of prediction errors of blocks with the first identity; and

~~a normalized sum of all~~ measures of prediction errors of blocks with a second identity ~~multiplied~~ combined with the time elapsed between the current frame and the reference frame;

performing the first sub-encoding on the current frame; and

performing a second sub-encoding on the first sub-encoded frame, the second sub-encoding adapting at least one encoding parameter based at least in part upon the computed characteristic.

38. (Currently Amended) A method of adaptive encoding at least a part of a current frame of a sequence of frames of framed data, with respect to a reference frame comprised in the sequence, the method comprising:

dividing the reference frame into blocks, wherein the blocks of the reference frame have a first identity when the blocks are intra-coded or when the blocks have a substantial zero motion vector, the blocks of the reference frame have a second identity otherwise, computing a characteristic which is ~~a sum~~based on ~~of~~:

the sum of all measures of prediction errors of blocks that have the first identity, and

a normalized sum of all measures of prediction errors of blocks that have the second identity multiplied bycombined the time elapsed between the current frame and the reference frame;

identifying selected blocks of the reference frame in accordance with the performance of a first sub-encoding that is applied to the reference frame;

computing a characteristic based on the identity of the blocks;

performing the first sub-encoding on the current frame; and

performing a second sub-encoding on the first sub-encoded frame, wherein the second sub-encoding adapts at least one encoding parameter based on the computed characteristic.

39. (Previously Presented) The method of Claim 1, wherein the characteristic is determined prior to buffering the current frame.

40. (Previously Presented) The method of Claim 7, wherein the characteristic is determined prior to buffering the current frame.

41. (Previously Presented) The apparatus of Claim 11, wherein the characteristic is determined prior to buffering the current frame.

42. (Previously Presented) The apparatus of Claim 12, wherein the characteristic is determined prior to buffering the current frame.

43. (Previously Presented) The method of Claim 13, wherein the characteristic is determined prior to buffering the current frame.

44. (Previously Presented) The method of Claim 15, wherein the characteristic is determined prior to buffering the current frame.

45. (Previously Presented) The method of Claim 16, wherein the characteristic is determined prior to buffering the current frame.

46. (Previously Presented) The apparatus of Claim 17, wherein the characteristic is determined prior to buffering the current frame.

47. (Previously Presented) The apparatus of Claim 18, wherein the characteristic is determined prior to buffering the current frame.

48. (Previously Presented) The apparatus of Claim 19, wherein the characteristic is determined prior to buffering the current frame.

49. (Previously Presented) The method of Claim 20, wherein the characteristic is determined prior to buffering the current frame.

50. (Previously Presented) The method of Claim 25, wherein the characteristic is determined prior to buffering the current frame.

51. (Previously Presented) The apparatus of Claim 28, wherein the characteristic is determined prior to buffering the current frame.

52. (Previously Presented) The apparatus of Claim 29, wherein the characteristic is determined prior to buffering the current frame.

53. (Previously Presented) The method of Claim 30, wherein the characteristic is determined prior to buffering the current frame.

54. (Previously Presented) The method of Claim 32, wherein the characteristic is determined prior to buffering the current frame.

55. (Previously Presented) The method of Claim 34, wherein the characteristic is determined prior to buffering the current frame.

56. (Previously Presented) The apparatus of Claim 36, wherein the characteristic is determined prior to buffering the current frame.

57. (Previously Presented) The method of Claim 37, wherein the characteristic is determined prior to buffering the current frame.

58. (Previously Presented) The apparatus of Claim 38, wherein the characteristic is determined prior to buffering the current frame.

59. (New) The method of Claim 37, wherein the characteristic is a sum of at least:

the sum of all measures of prediction errors of blocks that have the first identity; and

a normalized sum of all measures of prediction errors of blocks that have the second identity multiplied by the time elapsed between the current frame and the reference frame.

60. (New) The method of Claim 38, wherein the characteristic is a sum of at least:

the sum of all measures of prediction errors of blocks that have the first identity; and

a normalized sum of all measures of prediction errors of blocks that have the second identity multiplied by the time elapsed between the current frame and the reference frame.